ZAALISHVILI, Sh.D.; KOLYSKO, L.E.

Determining the vapor phase composition over a binary solution. (MIRA 15:6)
Zhur. fiz. khim. 36 no.4:887-889 Ap '62.

1. Gor'kovskiy politekhnicheskiy institut imeni Zhdanova.
(Thermochemistry) (Solution (Chemistry))

ZAALISHVILI, Sh.D.; BELOUSOVA, Z.S.; Prinimala uchastiye GORODINSKAYA, E.Ya.

Second virial coefficient of vapors and their mixtures. Part 4. Zhur. fiz. khim. 38 no.2:503-506 F '64. (MIRA 17:8)

1. Gor'kovskiy politekhnicheskiy institut.

ZAALISHVILI, Sh.D.; BELOUSOVA, Z.S.; KOLYSKO, L.F.; Prinimala uchastiye GORODINSKAYA

Second virial coefficient of vapors and their mixtures. Zhur. fiz. khim. 39 no.2:447-450 F '65. (MIRA 18:4)

1. Gor'kovskiy politekhnicheskiy institut.

ZAALISHVILI, Sh.D.; KOLYSKO, L.E.

Possibility of determining the vapor density and the second virial coefficient. Zhur. fiz. khim. 39 no.4:1016-1018 Ap '65.
(MIRA 19:1)

1. Gor'kovskiy politekhnicheskiy institut. Submitted June 28, 1964.

ZAAR, E.I.

Germination of twin plants from bisected seeds. Trudy Bot.inst. Ser.6 no.4:317-327 '55. (MIRA 9:2)

(Germination)

ZAAR, E.I.

Biological characteristics of English oak shoots. Bot.zhur.41 no.2:
253-254 F '56. (Oak) (MIRA 9:7)

ZAAR, E. I.

[redacted]

Some biological characteristics of seedling of Quercus robur L. (MIRA 12:11)
Bot.zhur. 44 no.5:648-651 My '59.

1. Leningradskiy gosudarstvennyy pedagogicheskiy institut im. A.I. Gertsena.
(Oak) (Seedlings)

ZAAR E. I., and LOZINA-LOSINSKIY L. K.

"Metabolism and immobilisation of Euglena gracilis Klebs in respect to the type of nutrition and light intensity."

Report presented at the 13th Annual meeting and 1st International Conference of Society of Protozoologists, Prague, 22-31 Aug 61

LOZINA-LOZINSKIY, L.K.; ZAAR, E.I.

Obtaining colorless cells of Euglena gracilis by brief exposures to high and low temperatures. TSitologiia 3 no. 1:103-105 Ja-F '61. (MIRA 14:2)

1. Laboratoriya kletochnykh adaptatsiy Instituta tsitologii AN SSSR, Leningrad.
(TEMPERATURE—PHYSIOLOGICAL EFFECT)
(CHLOROPHYLL) (FLAGELLATA)

ZAAR, E.I.; LOZINA-LOZINSKIY, L.K.

Laboratory equipment from organic glass for cytophysiological investigations. TSitologiia 3 no.3:359-361 My-Je '61. (MIRA 14:6)

1. Laboratoriya kletochnykh adaptatsiy Instituta tsitologii AN SSSR, Leningrad. (BIOLOGICAL APPARATUS AND SUPPLIES) (GLASS SUBSTITUTES)

ZAAR, E.I.

Effect of the length of illumination and spectral composition of light on the regenerative activity of apical meristem in shoots. Bot. zhur. 46 no.4:557-560 Ap '61. (MIRA 14:3)

1. Institut tsitologii Akademii nauk SSSR, Leningrad.
(Plants, Effect of light on) (Regeneration (Botany))

ZAAR, E.I.; YAKOVLEVA, Ye.A.

Effect of heteroauxin on the growth of the dormant buds of the cacao tree (Theobroma cacao L.). Bot.zhur. 47 no.2:280-282 F '62. (MIRA 15:3)

1. Botanicheskiy institut imeni V.L.Komarova AN SSSR i Institut tsitologii AN SSSR, Leningrad.
(Cacao) (Plants—Effect of indoleacetic acid on)

ZAAR, E.I.; YAKOVLEVA, Ye.A.

Grafting woody plants at the early stages of growth. Bot.zhur. 47 no.3:371-373 Mr '62. (MIRA 15:3)

15 Biology

1. Institut thitologii AN SSSR i Botanicheskiy institut imeni V.L.Komarova AN SSSR, Leningrad.

(Grafting) (Woody plants)

LOZINA-LOZINSKIY, L.K.; ZAAR, E.I.

Metaboly and immobilization of the cells of Euglena gracilis Klebs in relation ot the type of nutrition and illumination. TSitologiia 5 no.3:263-272 My-Je '63. (MIRA 17:5)

1. Laboratoriya kosmicheskoy biologii Instituta tsitologii AN SSSR, Leningrad.

ZAAR, E.I.; LOZINA-LOZINSKIY, L.K.

Multiple-hole microaquariums for cytophysiological and algological research. Bot.zhur. 49 no.10:1455-1457 O '64. (MIRA 18:1)

1. Institut tsitologii AN SSSR, Leningrad.

LOZINA-LOZINSKIY, L.K. ; ZAAR, E.I.

Photoreactivation of Paramecium caudatum in the long-wave region of the visible light spectrum. Sbor. rab. Inst. tsit. no.4:156-168 '63 (MIRA 17:3)

ZAAR, E.I.; KASINOVA, G.V.

Effect of some physical and chemical agents on the resynthesis of chlorophyll in the colorless cells of Euglena gracilis Klebs. Bot. zhur. 48 no.6:896-898 Je '63. (MIRA 17:1)

1. Botanicheskiy institut imeni V.L. Komarova AN SSSR, Leningrad.

ZAARKH, R.M.

BRAUNSHTEYN, A.Ye.; ZAARKH, R.M.

Effect of inhibition of reactions of the citric acid cycle on the synthesis of amino acids in surviving tissues in rats [with summary in English]. Vop.med.khim. 3 no.5:380-392 S-O '57. (MIRA 10:12)

1. Laboratoriya obmena azotistykh soedineniy Instituta biologicheskoy i meditsinskoy khimii AMN SSSR, Moskva.
(METABOLISM, TISSUE,
citric acid cycle, eff. of injib. on amino acid synthesis (Rus))
(AMINO ACIDS, metabolism,
biosynthesis, eff. of inhib. of citric acid cycle (Rus))

Z/034/61/000/009/002/002
E073/E535

AUTHORS: Žaba, Z. and Novotný, J.

TITLE: Equipment for rolling cooling fins on metals tubes
Patent Application Class 7b, 16/01, PV 6579-60 dated
November 3, 1960

PERIODICAL: Hutnické listy, 1961, No.9, p.672

TEXT: The machine is intended for producing ribs on copper or aluminium tubes. Fundamentally it consists of three grooved rollers and a sizing mandrel. The arrangement of the rollers in the stand is such that the bottom two rollers are supported in a stable manner and perform a forced rotary motion, whilst the third, top roll can revolve freely on an eccentric pivot, the movement of which until engagement is controlled by a lever, which is fixed onto the same pivot. The sizing mandrel is fixed to the end of the guiding tube in the thrust bearing so that, together with the rolled tube, it performs a rotary motion.

[Abstractor's Note: Complete translation.]

Card 1/1

ZABABAKHIN, YE. I.

AUTHORS: Zababakhin, Ye. I., Nechayev, M. N., 56-2-19/47

TITLE: Electromagnetic Field Shock Waves and Their Cumulation (Udarnyye volny polya i ikh kumulyatsiya)

PERIODICAL: Zhurnal Eksperim i Teoret, Fiziki, 1957, Vol. 33, Nr 2(8), pp. 442-450, (USSR)

ABSTRACT: The paper under consideration investigates a convergent cylindrical wave in the case of electromagnetic waves, where the width of the transition region from the initial state to the final state is narrow. The generation of a wave and its front width: A half-space filled with an ideal conductor is bounded by a vacuum with a stationary magnetic field H_{oy} along the plane $x = 0$. Furthermore, a plane shock wave is supposed to come out of this conductor, the entire surface of this conductor is to move suddenly with the velocity u in the direction towards the field. In the field, however, the elctromagnetic wave proceeds with the velocity c. A conservation law holds for the magnetic field strength analoguous to that of matter: $H_0 c = H_1(c-u)$, $H_1 = H_{oy}$ denoting the field strength in the rear of the wave. There exists no electric field in the coordinate system moving with the wall. Subsequently the pressure of the field on the moving wall is computed, and the width of the front of the field wave is evaluated, which is caused by the shock wave proceeding from the conductor with infinite conductivity. This width does not equal zero and its smearing is very small. The width of the front can be reduced considerably by

Card 1/2

Electromagnetic Field Shock Waves and Their Cumulation. 56-2-19/47

cooling the conductor. The convergent cylindrical wave of the field: A convergent wave can be obtained on the entire surface of the cylinder, in principle by suddenly opening a circular current, and by the reflexion of a plane or divergent wave at a concave mirror and by the motion of a cylindrical conductingsurface in a magnetic field. The amplitude of the cylindrical convergent wave grows with the approach to the axis beyondall limits with the term $R_o^{1/2}$. The next chapter deals withthe solution for a convergent cylindrical wave. Finally, reports are given on the range of applicability of the auto-model-like solution on cylindrical acoustic wave. There are 3 figures-

ASSOCIATION: Institute for Chemical Physics, AN of the USSR.
(Institut khimicheskoy fiziki AN SSSR)

SUBMITTED: February 11, 1957

AVAILABLE: Library of Congress.

Card 2/2

8570

K.76

S/040/60/024/006/022/024
C 111/ C 333

AUTHOR: Zababakhin, Ye. I. (Moscow)

TITLE: The Filling of the Bubbles in a Viscous Fluid

PERIODICAL: Prikladnaya matematika i mekhanika, 1960, Vol.24, No.6, pp. 1129-1131

TEXT: A bubble with radius a is assumed to arise in a fluid with the density ρ, pressure p_o, and viscosity η; let the initial velocity of the surface of the bubble and the internal pressure be = 0. Starting from the Navier-Stokes equations the author states that the nondimensional velocity of the bubble surface under filling of the bubble caused by the external pressure is described by the differential equation

$$\frac{d\xi}{d\alpha} + \frac{3}{2}\frac{\xi}{\alpha} + \frac{1}{\xi\alpha} + \frac{4}{\alpha^2} = 0 \tag{3}$$

where

$$\xi = \frac{u_1}{\sqrt{p_o/\rho}}, \quad \alpha = \frac{r_1 R}{a} \quad \left(R = \frac{a}{\nu}\sqrt{\frac{p_o}{\rho}}\right)$$

and u_1 and r_1 are the velocity and the radius of the surface.

Card 1/3

88770
S/040/60/024/006/022/024
C 111/ C 333

The Filling of the Bubbles in a Viscous Fluid

By discussion of the solutions of (3) the author states: If $R<8.4$, then the filling happens slowly in an infinitely long time, the energy cumulation is completely eliminated by the viscosity. If $R > 8.4$, then the velocity increases as $c \cdot r_1^{-3/2}$, where the constant c is smaller than in the case of vanishing viscosity. If $R = 8.4$, then the bubble will be filled in a finite time, however, u_1 increases more slowly than r_1^{-1}. For given p_0, ϱ and ν,

$$a_* = 8.4\,\nu\sqrt{\frac{\varrho}{p_0}}$$ can be denoted as critical radius.

Figure 2 shows the dependencies $r_1 = r_1(t)$ and $u_1 = u_1(r_1)$ for the cases $a > a_*$, $a < a_*$.

Card 2/3

56

89770

S/040/60/024/006/022/024
C 111/ C 333

The Filling of the Bubbles in a Viscous Fluid

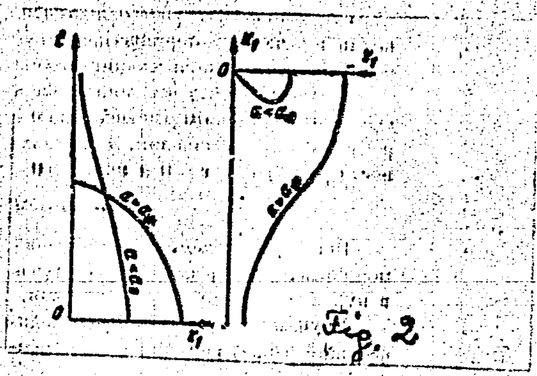


Fig. 2

There are 2 figures.

SUBMITTED: May 7, 1960

Card 3/3

L 1442-66 EWT(1)/EWP(m)/EWA(d)/FCS(k)/EWA(h)/EWA(c) WW

ACCESSION NR: AP5021129 UR/0056/65/049/002/0642/0646

48
36
B

AUTHOR: Zababakhin, Ye. I. 44,55

TITLE: Shock waves in layered systems

1,44,55

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 2, 1965, 642-646

TOPIC TAGS: shock wave propagation, strong shock wave, periodic system, energy cumulation

ABSTRACT: The author constructs a model of a self-similar layered system in which motion of a plane shock wave can be accompanied by a spontaneous unbounded growth pressure at the shock wave front, thereby demonstrating that unbounded energy cumulation is possible under conditions other than centripetal convergence of gas to a point or to a line. The system consists of alternating plane layers of light and heavy gases and is set in motion by a piston in such a way that the shock wave produced travels parallel to the layers. The thickness of each succeeding heavy layer is smaller than the preceding one, as is also the case for the light layers. The energy increases in such a system because each succeeding layer, being lighter, can bounce at higher speed. A preliminary qualitative estimate shows the pressure

Card 1/2

L 1442-66

12

ACCESSION NR: AP5021129

to increase as a/x^n (a = constant, x = longitudinal coordinate), with n = 0.23. In view of the fact that the gases are not always ideal, there exists a critical limit on the strength of the initial wave, below which the wave will attenuate rather than build up. "I thank L. A. Bunatyan, A. A. Bunatyan, K. K. Krupnikov, and V. F. Kuropatenko, who contributed much to the performance of this work." Orig. art. has: 4 figures and 3 formulas. [02]

14,55 14,55

ASSOCIATION: none

SUBMITTED: 09Mar65

ENCL: 00

SUB CODE: ME

NO REF SOV: 001

OTHER: 000

ATD PRESS: 4100

Card 2/2

ZABABAKHIN, Ye.I.; SIMONENKO, V.A. (Moskva)

Converging shock waves in a heat-conducting gas. Prikl. mat. i mekh. 29 no.2:334-336 Mr-Ap '65. (MIRA 18:6)

ZABABAKHIN, Ye.I.

Energy cumulation and its limits. Usp. fiz. nauk 85 no.4:721-726
Ap '65. (MIRA 18:5)

ZADABURIN, I. A. (ENG.) PETROV, G. A. (PROF.)

Water Supply Engineering

Planning open intakes for sea water. Elek. sta. 23 No. 8, 1952.

Monthly List of Russian Accessions. Library of Congress. November 1952. Unclassified.

14(10) SOV/98-59-6-14/20

AUTHORS: Konopkin, B.K., Candidate of Technical Sciences and Tkachenko, V.A., Engineer; Zababurin, I.A., Candidate of Technical Sciences

TITLE: On Hydraulic Resistances of the Sub-Surface Flat Floodgates of Round Cross-Section

PERIODICAL: Gidrotekhnicheskoye stroitel'stvo, 1959, Nr 6, pp 48-49 (USSR)

ABSTRACT: In the first part of this article the first two authors criticize the article under the same title by I.A. Zababurin published in Nr 2 (1956) of this periodical, and in the second part, Zababurin defends his viewpoint. His opponents find that the resistance coefficient as given by Zababurin is exaggerated and, as a result, the real passing capacity of the floodgate will be different from that indicated by Zababurin. The latter explains that his opponents checked his formula with a model of a floodgate, different from the one he described, and which

Card 1/2

SOV/98-59-6-14/20

On Hydraulic Resistances of the Sub-Surface Flat Floodgates of Round Cross-Section

is at present widely used. There are 2 diagrams.

Card 2/2

ZABABURIN, I. A.

AID P - 1443

Subject : USSR/Meteorology and Hydrology

Card 1/1 Pub. 17-a - 17/23

Author : Zababurin, I. A., Kandidat of Tech. Sci.

Title : On measuring velocities of small water currents

Periodical : Met. i gidro., 1, 49-51, Ja - F 1955

Abstract : An apparatus is suggested and described with two types of microvanes: 1) propeller, and 2) cup, for measuring small velocities (at about 1.6 cm/sec) and shallow depths of water currents of less than 0.2 meters/sec.
Two diagrams, one photophate, and one graph.
No references.

Institution: Main Administration of the Hydrometeorological Service at the Council of Ministers of the USSR

Submitted : No date

ZABABURIN, I.A., kand.tekhn.nauk

Control of flows in cooling ponds. Trudy Gidrav.lab.VODGEO no.8:122-127 '62. (MIRA 15:11)
(Hydraulic structure)

ZABABURIN, I.A. (Khar'kov)

Taking measures to increase the cooling capacity of cooling ponds. Vod. i san. tekh. no.11:34-36 N '61. (MIRA 15:6)
(Ponds)

ZARABURIN, I.A., kandidat tekhnicheskikh nauk.

Hydraulic resistances in deep flat sluice gates of circular cross section. Gidr.stroi. 25 no.2:41-43 '56. (MLRA 9:8)

(Sluice gates)

ZABABURIN, I.Z., kand.tekhn.nauk; PETROV, G.A., doktor tekhn.nauk

New method for utilizing certain types of cooling reservoirs.
Elek.sta. 29 no.8:43-45 Ag '58. (MIRA 11:11)
(Hydroelectric power stations--Water supply)

S/124/62/000/005/031/048
D251/D308

AUTHOR: Zababurin, I.A.

TITLE: A micro-gyrator for measuring the averaged and pulsational velocities of a current

PERIODICAL: Referativnyy zhurnal. Mekhanika, no. 5, 1962, 133, abstract 5B870 (V sb. Novyye metody izmereniy i pribory dlya gidravlich. issled. M., AN SSSR, 1961, 71 - 74)

TEXT: A micro-gyrator was constructed permitting one to obtain contact through a part of one turn of the rotor of the gyrator which gives the possibility of constructing a smooth curve of the dependence of the velocity of motion of the liquid on time. The frequency of the pulsations of the longitudinal velocity may be measured with sufficient accuracy by a micro-gyrator with 8 blades. If the velocity of this is 0.5 m/sec. the period of the smoothing is equal to 0.04 sec. 5 references. [Abstractor's note: Complete translation].

Card 1/1

ZABABURIN, M.I.; SPIRIN, P.P.

Course of the development of the peat winning and utilization in the Urals. Torf.prom. 36 no.1:11-12 '59. (MIRA 12:3)

1. Sverdlovskoye upravleniye torfyanogo fonda (for Zababurin). 2. Ural'skiy filial AN SSSR (for Spirin).
(Ural Mountain region—Peat)

ZABABURINA, Z. V.

mical Abst.
46 No. 3
10, 1954
gical Chemistry

(4)

Pectic substances and hemicelluloses of the stems of hemp. M. V. Kostrubin, Z. V. Zababurina, and V. S. n kova (Orlov State Pedagog. Inst., Chair of Chem.) khimiya 18, 263-70(1953); cf. Scientific Repts. of lov State Pedagogical Inst. No. 2, 113(1947). — Data obtained indicate that the compn. and transformation of pectic substances and hemicelluloses in the stems of flax and hemp during the process of their growth are dif

B. S. Levine

18.8400

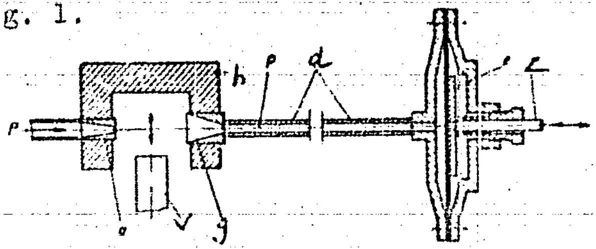
77625
SOV/133-60-2-25/25

AUTHORS: Damrin, V. T., Zabak, B. T. (Engineers)

TITLE: Hydraulic Jet Position Pick-up

PERIODICAL: Stal' 1960, Nr 2, pp 189-191 (USSR)

ABSTRACT: Newly developed hydraulic jet pick-up assures safe control of machinery under the exact conditions of a metallurgical plant. The developed schematic diagram is shown in Fig. 1.



Card 1/4

Fig. 1: Schematic diagram of hydraulic jet pick-up of position.

Hydraulic Jet Position Pick-up

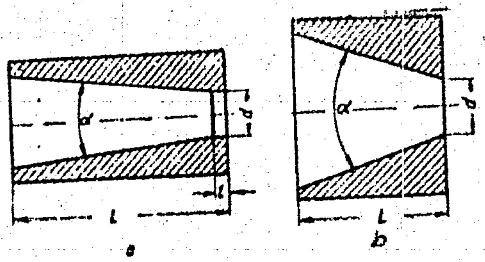
77625
SOV/133-60-2-25/25

Water is supplied under pressure (P) to the discharge nozzle (a) which is fastened in holder (b). If the part of mechanism (v) does not shut off the jet the jet gets into intake nozzle (g), and dynamic pressure is transformed into the static pressure received through impulse pipe d by membrane transformer (e). Change of rod position (z) can be transformed into an electric impulse by contact or contactless method. The geometrical characteristics of discharge and receiving nozzle is shown in Fig. 2 and Table below. Indicator of damper position and position of front roller for piercing mill was developed on the basis of this hydraulic jet pick-up. During the operation it was found that: (1) pick-up is simple and reliable; (2) easy to operate; (3) can be placed in small space; (4) transformer can be removed from jet unit to a relatively big distance (20 mtr); (5) pick-up is not sensitive to displacement of mechanisms except for

Card 2/4

Hydraulic Jet Position Pick-up

77625
SOV/133-60-2-25/25



distance between nozzle mm	°	d mm	$\frac{L}{d}$	l mm
1000	$\frac{13}{30—35}$	$\frac{5}{8}$	$\frac{8—10}{6—7}$	$\frac{2}{--}$
300	$\frac{13}{30—35}$	$\frac{3}{8}$	$\frac{4—5}{3—4}$	$\frac{0}{--}$

Card 3/4

Fig. 2 and Table. The geometrical characteristics of discharge (a) and receiving (b) nozzles (dimensions in Table). Numerator - for discharge nozzle denominator - for receiving nozzle.

Hydraulic Jet Position Pick-up

77625
SOV/133-60-2-25/25

those being controlled; (6) impact, vibration, high-temperature, moisture, contamination by scale and lubricating material do not influence pickup's performance; (7) consumption of water (Q) with 5 mm diam discharge nozzle amounts to:

P, atm	1	2	3
Q, l/hr	1,000	1,450	1,800

There are 5 Figures and 1 Table.

ASSOCIATION: (Tuvmetallurgavtomatika)

Card 4/4

L 05026-67 EWT(1)

ACC NR: AR6032291 SOURCE CODE: UR/0275/66/000/007/A016/A016

5

AUTHOR: Zabalkanskiy, E. S.

B

25

TITLE: Methods of calculating dependence of current on frequency in klystrons

SOURCE: Ref. zh. Elektronika i yeye primeneniye, Abs. 7A112

REF SOURCE: Tr. uchebn. in-tov svyazi. M-vo svyazi SSSR, vyp. 27, 1965, 33-42

TOPIC TAGS: four cavity klystron, current frequency dependence

ABSTRACT: Two methods of calculating the first harmonic of convection current I_1 in 4-cavity klystrons are proposed. The influence of the signal level on the dependence of I_1 on frequency under power conditions close to maximal, is analyzed qualitatively using the results obtained by an approximate method. It is demonstrated that under these conditions the cavity parameters determined at a small signal should produce in the initial band a current amplitude irregularity of ~ 1.5 db. It is pointed out that in order to obtain more accurate relationships under maximal power conditions, it is necessary to calculate currents by means of numerical integrations. [Translation of abstract]

SUB CODE: 09/

Card 1/1 pla UDC: 621.385.623.4

ZABALUYEV, A.

Cleaning glass. Stroitel' no.5:14 My '61. (MIRA 14:6)
(Windows--Cleaning)

ZABALUYEV, A.

Happy journey. Izobr.i rats. no.7:29 Jl '59.
(MIRA 12:11)

1. Sekretar' oblastnogo soveta Vsesoyuznogo obshchestva izobretateley i ratsionalizatorov (VOIR), g.Ivanovo.
(Efficiency, Industrial)

ZABALUYEVA, I.F.

Preparation of Rh antiserum using polyglucin as a solvent.
Porbl. gemat. i perel. krovi 9 no.4:49-50 Ap '64.
(MIRA 17:11)

1. Lipetskaya oblastnaya stantsiya perelivaniya krovi
(dir. A.A. Yemal'yanov).

ZAbAluyev, I. P.,

133-10-8/26

AUTHOR: Zabaluyev, I. P., Bobkov, T. M. and Tarashchuk, N. T.

TITLE: Smelting of Chromium Nickel Steel Using Pelletised Nickel Oxide. (Vyplavka Khromonikelevoy Stali s Primeneniyem Okomkovannoy Zakisi Nikelya).

PERIODICAL: Stal', 1957, No.10, pp. 899-901 (USSR).

ABSTRACT: First laboratory experiments on the application of nickel oxide in steelmaking were carried out by L. I. Aronov et al in the Moscow Institute of Steel (Stal', 1947, No.3). In the present paper the confirmation of the possibility of the application of nickel oxide in the production of nickel containing steels on 20 ton and 30 ton basic electric arc furnaces is described. The following participated in the work: G. P. Malikov, G. I. Kabakov and N. M. Shabli. Altogether 18 experimental heats of structural steel (12XH3A) and stainless steel (1X18H9T) were carried out in which pelletised nickel oxide (containing over 20% of Ni in metallic form, total content of nickel 81.0-82.0%) prepared by Yuzhuralnikel' was used. The pellets are shown in Figure 1. In 8 heats nickel oxide was added on to the slag during the oxidation period, thus using it as an oxidant and alloying

Card 1/3

133-10-8/26

Smelting of Chromium Nickel Steel Using Pelletised Nickel Oxide.

element. The recovery of nickel in metal was not lower than 98%. The character of assimilation of nickel oxide in the bath is shown in Table 1 and the oxidation of carbon in Figure 2. The influence of nickel oxide additions on the oxidation of C, P and Mn during smelting steel 12XH3A is shown in Table 2. As under the works conditions chromium nickel structural steels and stainless steels are usually produced by remelting 1 heat for 12XH3A steel and 5 heats for 1X18H9T were carried out in which nickel oxide was added to charges in the equivalent amounts to the usual additions of metallic nickel. The degree of recovery of nickel in the metal could not be established as the percentage of Ni in the nickel scrap was not known, however, the nickel content of slag after melting was not higher than 0.18%. The quality of metal so produced was tested on rolled products according to ГОСТ 4543-48 and ГОСТ 5632. The quality of metal was found to be satisfactory, hydrogen content of metal before tapping was the same as in the usual heats. Specific power consumption during smelting with the application of pelletised nickel oxide increased by 5-7 kWh/ton. As the cost of nickel in the form of pelletised nickel oxide is lower

Card 2/3

Smelting of Chromium Nickel Steel Using Pelletised Nickel Oxide. 133-10-8/26

than nickel H3 and H4, the use of pelletised oxide is advantageous. There are 2 tables, 2 figures and 2 references, both of which are Slavic.

ASSOCIATION: Dneprospetsstal' Works and Gipronikel'. (Zavod Dneprospetsstal' i Gipronikel')

AVAILABLE: Library of Congress

Card 3/3

ZABALUYEV, I.P.,

133-10-15/26

AUTHOR: Zabaluyev, I. P., Travinin, V. I. and Kovaleva, M. A. Engineers.

TITLE: **The Technology of the EI437A Heat-resisting Alloy Rolling.** (**Tekhnologiya** Prokatki Zharoprochnogo Splava ЭИ437А.)

PERIODICAL: Stal', 1957, No.10, pp. 919-923 (USSR).

ABSTRACT: The development of the rolling conditions for forged semis of the above alloy (squares 95 mm) into rounds of 32 and 35 mm is described. Operating practice giving a satisfactory yield of good metal with required mechanical and heat resistance properties and macro and microstructure was established. In conclusion it is stated that in order to improve further heat resisting properties of the above alloy more investigation on heating and rolling practice are necessary. There are 4 tables and 7 figures.

ASSOCIATION: Dneprospetsstal' Works. (Zavod Dneprospetsstal').

AVAILABLE: **Library of Congress**

Card 1/1

SOV/137-59-3-6441

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 3, p 214 (USSR)

AUTHORS: Zabaluyev, I. P., Semchenko, O. A.

TITLE: On the Mechanical Properties of Steel 1Kh18N9T (K voprosu o mekhanicheskikh svoystvakh stali marki 1Kh18N9T)

PERIODICAL: Tekhn.-ekon. byul. Sovnarkhoz Zaporozhsk. ekon. adm. r-na, 1958, Nr 3, pp 42-44

ABSTRACT: The results of quality-control samplings of 846 production smeltings of pipe steel 1Kh18N9T at the "Dneprospetsstal'" plant were processed statistically. A relationship was established between the σ_b value and the profile of the stock (85-180 mm in diameter) as well as the concentration of C (0.06-0.14%). It is demonstrated that finished pipes possess a σ_b value which exceeds that of the billets by 6-18%; in the case of cold-rolled pipes, this difference amounts to 33%. It is suggested that, in the case of smeltings containing 0.06-0.08% C, the Technical Specifications relative to σ_b be changed from a minimum value of 56 kg/mm^2 to a minimum value of 53 kg/mm^2.

T. F.

Card 1/1

KALINNIKOV, Ye.S.; ZABALUYEV, I.P.

Hydrogen content in alloyed electric steel. Izv. vys. ucheb. zav.; chern. met. no.2:45-50 '61. (MIRA 14:11)

1. TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgi.
(Steel alloys--Hydrogen content) (Electrometallurgy)

SOV/137-59-3-6438

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 3, p 21 (USSR)

AUTHORS: Khitrik, S. I., Kazachkov, I. P., Zabaluyev, I. P., Babkov, T. M., Moshkevich, Ye. I.

TITLE: The Effect of Nonmetallic Inclusions of Ferrochrome on the Quality of Stainless Steel (Vliyaniye nemetallicheskikh vklyucheniy ferrokhroma na kachestvo nerzhaveyushchey stali)

PERIODICAL: Tekhn.-ekon. byul. Sovnarkhoz Zaporozhsk. ekon. adm. r-na, 1958, Nr 3, pp 44-47

ABSTRACT: The effect of the contamination of ferrochrome on the quality of stainless steel 2Kh13 was studied by means of determining the content of nonmetallic inclusions (NI) with the aid of electrolytic precipitation methods and with the aid of an analysis of the macrostructure of bar stock. A direct relationship was established between the content of the NI in ferrochrome and in steel. The employment of vacuum-treated ferrochrome containing not more than 0.75% Si ensures the production of steel with a lower content of NI and with a smaller number of hairline cracks.

Card 1/1

T. F.

SOV/133/58-9-18/29

AUTHOR: Zabaluyev, I. P.

TITLE: At the "Dneprospetsstal'" Works (Na zavode "Dneprospetsstal'")

PERIODICAL: Stal', 1958, Nr 9, p 827 (USSR)

ABSTRACT: A decrease of crop ends during forging of ingots of steels R 18, R 9 and EI347.

A decrease of 1% of the loss of metal in crop ends was obtained (no details).

The possibility of forging round profiles (140-180 mm dia) from steels Kh12, Kh122FI and 3Kh2V8 and of strip of a cross section 40-60 x 140-150 mm from steel R9 directly from ingots (by-passing intermediate production of semis) was successfully tested.

A decrease in the duration of heating semis from steels R18, R9, EI347, Kh12, Kh12FI in furnaces for forging with 2 and 3 ton hammers.

A 7% decrease in the duration of heating and an improvement in the quality of metal was obtained.

Development of the technology of heating metal in order to decrease the decarburised layer during rolling ball bearing steel.

The process of heating of ball bearing steel during rolling from ingots to the finished rolled product was investigated.

Card 1/3

SOV/133/58-9-18/29

At the "Dneprospetsstal'" Works

On the basis of the results obtained a technology of production of rolled products was developed (not specified).

The determination of expansion on metal after calibration and straightening.

In order to prevent the production of defective drawing tools the actual expansion of metal after calibration and straightening was investigated. It was established that the expansion increases with increasing carbon content in steel 10-50. In the annealed rolled steels 40-50 and ShKh the expansion of metal after calibration is lower than in non-annealed metal. The expansion of metal after straightening increases with increasing size and pressure of rollers and the number of passes through straightening mill. During and after recrystallisation annealing a contraction takes place (a decrease in the metal thickness). As a result of the investigation it was recommended that on manufacturing dies the minus tolerance should be larger by 0.04-0.05 mm than the sum

Card 2/3

SOV/133/58-9-18/29

At the "Dneprospetsstal'" Works

of the expansion after the calibration and straightening.

The determination of load on motors of the main drives of mills 825, 328 and 280.

Loads during rolling of various steels were determined in order to provide information on the possible reserve in the capacity of the mills.

Card 3/3

AUTHOR: Zabaluyev, I.P. SOV/133-58-10-27/31

TITLE: At the "Dneprospetsstal'" Works (Na zavode "Dneprospetsstal'")

PERIODICAL: Stal', 1958, Nr 10, p 949 (USSR)

ABSTRACT: 1) An investigation of the recrystallisation of an alloy EI437 and its influence on the structure of metal. The influence of the recrystallisation and the dependence of the appearance of differences in grain sizes and banding on temperature and soaking time during annealing, degree of deformation, the temperature at the end of deformation and the initial structure were investigated. On the basis of the results obtained, the diagram of recrystallisation ranges for the condition of deformation near to those during rolling was constructed.

2) An improvement of the technology of annealing and increase of throughput of furnaces in the heat treatment department. As a result of an investigation, the possibility of increasing the weight of charge and a decrease in the duration of annealing without a deterioration in the quality of annealing was established (no details given).

3) The nature of non-metallic inclusions in contaminated ball-bearing steel.

Card1/2 The nature of non-metallic inclusions in ball-bearing steel

At The "Dneprospetsstal'" Works SOV/133-58-10-27/31

was investigated on 1 300 specimens from 380 heats. It was found that the quantity of non-metallic inclusions is satisfactory and rejected heats was practically the same (0.015 and 0.017%, respectively) thus in good metal the inclusions are only more uniformly distributed. Inclusions of rejected specimens contained on average 55.9% of Al_2O_3 and 28.1% of SiO_2 and in good metal 65.9% and 20.2%, respectively. In rejected specimens, inclusions of CaO and MgO (total up to 15%) were found; these were not present in accepted metal.

4) Development of annealing technology in a heat treatment furnace with moving step-by-step bottom. During testing of the furnace, some design deficiencies were found. The furnace can be used only for high-temperature annealing of structural steel of a length not exceeding 3 m.

Card 2/2

AUTHOR: Zabaluyev, ~~I.P.~~ SOV/133-58-11-14/25

TITLE: ~~At~~ the "Dnepmspetsstal'" Works (Na zavode "Dneprospetsstal'")

PERIODICAL: Stal', 1958, Nr 11, pp 1003 - 1004 (USSR)

ABSTRACT: 1) Intensification of electro-smelting of ball-bearing steel. (In co-operation with the Dnepropetrovsk Metallurgical Institute).

The works are the largest producers of ball-bearing steel. As a result of a number of investigations, a new technology of smelting this steel was developed. Characteristic features of this technology are: during boiling not less than 0.25% of carbon should be eliminated without overheating the metal; before the removal of oxidising slag, the metal temperature should be approximately the same as at tapping. The reducing period is carried out under a white slag with an addition of ferro-chromium on the clean surface of metal at the beginning of refining. Slag and metal are deoxidised with 3-4 portions of a mixture of ground coke, powdered 75% ferro-silicon and lime. To the last portion which is added 10 minutes before tapping, powdered aluminium is also added (0.5 kg/ton). Slag before tapping should contain not less than 5% of CaO and not more than 0.5% of CaO_2 and 0.4% of FeO. The temperature of the metal

Card1/7

before tapping should be 1 545 - 1 565 °C (immersion thermocouple). Aluminium in a proportion of 0.5 kg/t is added on a rod fixed to the side of the teeming ladle. The heat is tapped so as to treat it with slag in the ladle; at first, a large proportion of slag is tapped into the ladle and then the metal with the remaining slag. The refining period is 75 - 90 minutes. The metal is retained in the ladle before teeming for 15 minutes. Over 200 heats were carried out using the above technology, which gave a 10% decrease in the duration of the heat.

2) The influence of vacuo-treatment of ferro-chromium on the quality of stainless steel (in co-operation with DMI). As vacuo-treated ferro-chromium contains about 25% less of non-metallic inclusions and gases (6 - 8 cm^3 instead of 15 cm^3/100 kg) its use in smelting stainless steel 2Kh13 was tested. It was found that by replacing the usual ferro-chromium with vacuo-treated ferro-chromium, the content of non-metallic inclusions in the stainless steel produced also decreases with a simultaneous decrease in the proportion of defects due to hair cracks. The useof vacuo-treated ferro-chromium, containing not more than 0.75% of silicon

is recommended.
3) The use of nickel oxide instead of metallic nickel for smelting steel in arc furnaces (in co-operation with the Gipronikel' Institute).
The use of nickel oxide instead of metallic nickel in smelting alloy steels was tested on 18 heats of steels 12KhNZA and 1Kh18N9T. Pelletised nickel oxide of a high mechanical strength (crushing strength 50 kg/cm^2) and specific gravity of 6.3 - 6.7 g/cm^3 was used. Nickel oxide was added to the charge onto the slag during the oxidising period and during the removal of the slag. It was established that: a) nickel is quickly transferred into the metallic bath (98% recovery); b) there is no increase in the hydrogen content of steel and c) the quality of the steel remains the same as in the usual heats.
4) Electric arc heating of the shrinkage head of ingots of electric steel weighing 2.85 tons (in co-operation with TsLA and TsNIIChM).
An experimental installation for heating tops of bottom-poured ingot moulds (simultaneously 4 ingots) was designed and tested. The duration of heating from the end of teeming

- 1 hour and 26 minutes. Power consumption 32 - 35 kWh/t and the consumption of the slag-forming mixture added to the top, 25 kg/ingot. Hot tops were lined with magnesite chromite bricks. The slag-forming mixture consists of: 80% lime and 20% of chamotte powder. The use of electric heating increased the yield of good metal by 6-8%. The heating installation requires re-designing as it was found to be cumbersome in use.

5) Gas heating of ingot tops of electric steel (in co-operation with TsNIIChM).

An experimental installation for gas-oxygen heating of ingot tops (2.85 t) was developed. The duration of heating 60 - 70 minutes. Coke-oven gas is burned with an insufficient amount of oxygen (gas - 27.3 m^3/t; oxygen 12 m^3/t). The installation was tested on teeming 1Kh18N9T steel. The use of a mixture of 96% of white electric-furnace slag (14-15% SiO_2, 42-45% CaO) and 4% of aluminium powder completely prevents oxidation of titanium. Slag is added in an amount of 25-30 kg/ingot immediately after the end of teeming. A 6-7% increase in the yield of metal is being obtained. An industrial heating installation is being designed.

6) An improvement in the quality of transformer steel. Vacuo treatment of a stream of transformer steel during pouring from one ladle to another (6-7 min) resulted in a 20% decrease in hydrogen content and an improvement in the quality of steel.

7) A study of the influence of finishing slag on the degree of contamination of ball-bearing steel with non-metallic inclusions (in co-operation with the Institute of Metallurgy of the Ac.Sc.USSR).

Radioactive calcium added to slag in the form of calcium oxide powder 30-65 minutes before tapping of ShKh15 steel was used for the investigation. Samples of rolled steel were taken for metallographic analysis and the determination of non-metallic inclusions. The possibility of contamination of steel with slag during tapping was established. On tapping steel under a basic slag of increased viscosity, the metal is less contaminated than when the slag of a lower basicity is used.

8) A study of properties of an alloy electric steel, treated in vacuo (in co-operation with the Institut

metallurgii AN SSSR (Institute of Metallurgy of the Ac.Sc. USSR).
Properties of steels 18KhNVA, 30KhGSNA, ShKh15 and 40KhA smelted and treated by the following methods were studied: a) smelted by the usual technology and vacuo-treated in the ladle; b) smelted by the usual technology and vacuo treated during pouring from one ladle into another, and c) smelted with a shortened oxidising period and vacuo treated during pouring from one ladle into another. It was established that the quality of vacuo treated steel, in respect of hair cracks and fracture, is improved. In respect of macrostructure and mechanical properties no substantial differences were found.
9) The use of argon during casting of electric steel. In order to improve the surface quality and macrostructure of ingots and to decrease metal losses in shavings, argon was introduced into ingot moulds (initially directly into the mould and later through the central casting refractory). When the neutral atmosphere in the moulds was obtained, teeming of steel was carried out (usually into non-coated moulds). Altogether 112 heats of various steels into

At the "Dneprospetsstal'" Works SOV/133-58-11-14/25

ingots weighing from 1.0 to 2.85 tons were carried out. A considerable improvement in the macrostructure of steel was obtained (the proportion of defective macrotemplets decreased by a factor of 2). The surface of the ingots was also improved.

Card 7/7

AUTHOR: Zabaluyev, I.P., Engineer SOV/133-59-5-29/31

TITLE: At the "Dneprospetsstal'" Works (Na zavode "Dneprospetsstal'")

PERIODICAL: Stal', 1959, Nr 5, p 467 (USSR)

ABSTRACT: A study of the operation of soaking pits servicing mill 825 in order to increase their throughput.
In order to increase the throughput of the above soaking pits, the following factors were utilised: a) increasing the temperature of the pits during charging; b) increasing the rate of rising of the temperature; c) discontinuation of soaking without gas supply for ingots with charging temperature above 700 °C; d) using a temperature step up during soaking: on attaining a required temperature of the pit, it is raised further to the attainment of the required temperature by the surface of the ingots, after which the temperature of the pit is lowered to the required level and the ingots are soaked until the minimum

Card1/2

permissible temperature drop between the surface and the centre of the ingots is obtained. Experiments were carried out on ingots of steels 20Kh2N4A, 38KhMYuA and 1Kh18N9T. As a result, a 10-12% increase in the throughput was obtained without decreasing the quality of the metal.

SOV/133-59-6-35/41

AUTHOR: Zabaluyev, I.P., Engineer

TITLE: At the Works "Dneprospetsstal'" (Na zavode „Dneprospetsstal'")

PERIODICAL: Stal', 1959, Nr 6, p 567 (USSR)

ABSTRACT: 1. Determination of the nature of globular inclusions in ball bearing steel. An investigation of the above inclusions indicated that some consist of ferrous iron with possibly an admixture of manganous oxide and some are mixtures of aluminosilicates with admixtures of iron and manganese.

2. An investigation of the nature and causes of micro and macro cracks in quality ball bearing steel. Carbide segregation was traced as a cause of the above defects.

3. Development of a new technology of working steel 1Kh18N9T in order to obtain it with a minimum proportion of α phase. As tube billets (120 - 170 mm dia) often contained more α phase than is permitted by standards the following treatment was developed in order to decrease it. After rolling the metal was annealed at 1100°C for 2.0 - 2.5 hours and then cooled in running water. The treatment considerably

Card 1/3

At the Works "Dneprospetsstal'"

decreased the proportion of α phase so that the steel can be produced with the nickel content at a lower limit.

4. The removal of causes of formation of tears on the edges of hot rolled coils of transformer steel. The cause of defects was traced to the underheating of slabs. By decreasing the thickness of the slabs to 130 mm the proportion of defective coils sharply decreased.

5. An improvement in practices of thermal treatment of quality metal in order to improve the quality of annealing and to increase the throughput of the furnaces. Some new annealing practices were developed which permitted decreasing the annealing time. For some steels simultaneous improvement in the quality of annealed metal was also obtained.

6. Development of cooling conditions for forgings from steels 3Kh13, 4Kh13, 4Kh8V2, KhV5 and for small profiles of steel R18 in unfired pits. It was found

SOV/133-59-6-35/41

At the Works "Dnepropetsstal'"

possible to cool forgings of the above steels in unfired pits by increasing their temperature to 150°C and increasing the residence time of metal to 48 hours. A decrease of metal losses in crops of about 67 kg/t was obtained.

7. The removal of carbide fissures in forgings of steels KhG and KhVG. Optimum heating conditions, end of forging and cooling of forgings of the above steels to prevent the formation of carbide fissures were established. Heating for forging to 1150°C, end of forging 750 - 800°C, cooling to 700 - 650°C and then slow cooled in unfired pits.

Card 3/3

SOV/133-59-9-14/31

AUTHOR: Zabaluyev, I.P., engineer

TITLE: On the „Dneprospetsstal'„ Works

PERIODICAL: Stal', 1959, Nr 9, p 811 (USSR)

ABSTRACT: 1. A study of causes of the formation of cracks in chromium-nickel steels 18KhNVA and 12KhN3A. It was found that the proportion of defects during rolling of ingots placed hot into soaking pits was 10 to 11 times higher than on rolling ingots heated from cold. The smallest proportion of defects for 18KhNVA steel was obtained from ingots which were teemed up to shrinkage head in 160 to 200 seconds, the highest proportion was given by ingots teemed in 150 to 160 seconds. The largest proportion of defective metal from ingots which were placed into soaking pits when hot was obtained when the time between teeming and placing into the soaking pits varied between 2.5 hours and 3.5 hours. When the retention time was less than 2.5 hours, the proportion of defects decreased for steel 18KhNVA by a factor of 2 (approximately to 0.5%) and for steel 12KhN3A to nil.
2. The influence of the composition of the charge on the quality of steel 30KhGSNA. Smelting of steel was done

Card 1/3

SOV/133-59-9-14/31

On the „Dneprospetsstal'„ Works

from 4 types of charges (not specified) in basic arc furnaces. Two heats of each type were deoxidised in the furnace with aluminium (0.3 kg/t) and in the ladle with silicocalcium (2 to 3 kg/ton, fraction not larger than 50 mm) and two heats with only aluminium in the furnace. The quality of the metal deoxidised by the first method evaluated by stepwise machining was found to be inferior to that deoxidised by the second method; however, impact strength of transverse specimens from the former metal was about 25% higher than those from the latter.

3. Application of widening tops on teeming steels 18KhGT, 50KhGT and 15KhGNTA. Defects due to edge contamination of the macrostructure of rolling products from the above steels are often encountered. This is caused by the bending over of the crust mainly where the surface of the metal passes from the mould into the top, the bottom of which is narrower than the upper cross-section of the mould. To prevent this, widened tops were tested, the use of which substantially improved the yield

Card 2/3

SOV/133-59-9-14/31

On the „Dneprospetsstal'„ Works

of good metal:

Type of steel	18KhGT	30KhGT	15KhGNTA
% yield with previous technology	71.5	79.0	92.6
% yield with widened tops	100	96.2	99.2

4. Testing of experimental hollow electrodes on a 40 ton electric furnace. Tests of hollow electrodes with external diameter 500 mm and internal diameter 225 mm indicated that the diameter of the hollow was too large (appearance of longitudinal cracks and occasionally electrodes completely broke down). A decrease in the deviation of the electric arc from the vertical position and some increase in cos φ, particularly during the boiling period (from 0.904 to 0.927) with a small decrease (1%) in power consumption per heat.

ZABALUYEV, I.P.

S/148/60/000/008/002/018
A161/A029

AUTHORS: Chuyko, N.M.; Rutkovskiy, V.B.; Konishchev, N.P.; Zakryatko, A.Z.; Tregubenko, A.F.; Yatskevich, I.S.; Zabaluyev, I.P.; Kurganov, V.V.; Bobkov, T.M.; Antipenko, G.I.

TITLE: A New Smelting Technology Under White Slag for Ball Bearing Steel of Grade ШХ15 (ShKh15)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. - Chernaya metallurgiya, 1960, No. 8, pp. 38 - 47

TEXT: At the "Dnepropetstal'" Works up to 1956 ShKh15 steel was teemed simultaneously with slag and no attention was paid to steel treatment by slag in the ladle during the teeming. The final S content of 0.02% was obligatory and the refining took between 2 h 10 min and 2 h 40 min or more. The refining time had been cut down to 1 h 50 min - 2 h 10 min by addition of ferrochrome into non-reduced metal with a content of 0.025% S. To boost the heat process and to improve the metal quality, N.M. Chuyko suggested to cut the refining time to 1 h 10 min or less by deoxidation and desulfuration of the metal with electric furnace slag in the ladle during teeming. The article contains details of this new

Card 1/3

technique. The effect of the oxidizing and reducing heat period factors was determined. The formation of highly-basic and well deoxidized slag was mainly studied. The slag quantity used was 4 - 5% of the metal weight with a CaO content of over 53%, FeO below 0.4% and CaF_2 below 2.0%. First a considerable quantity of slag was spilled through a widely open hole into the ladle, and then metal poured from 3 - 4 m height in a solid jet, which brought about a large contact area with slag and rapid deoxidation and desulfuration. The optimum parameters of the oxidation period were stated to be: $\Delta[C] = 0.3 - 0.5\%$ at a carbon burning rate of 0.4 - 0.5%/h, and a metal temperature of 1,545 - 1,565°C before skimming the oxidizing slag. The reducing period under lime-chamotte white slag with low calcium fluoride content proved to be expedient, as well as the treatment of the metal in the ladle by this slag. The optimum slag composition is: $(FeO) < 0.5\%$; $(CaF_2) = 1 - 2\%$; $\Sigma(SiO_2 + Al_2O_3) = 31 - 34\%$; $(CaO) \geq 53\%$; $(MgO) \leq 12\%$, and $\Sigma(CaO + FeO) = 63 - 65\%$. The optimum metal temperature before teeming is 1,550 - 1,575°C; it ensures the filling of a 2.8-ton ingot during 165 - 190 sec. Final deoxidation of steel by aluminum in the ladle gives a high reduction of oxygen content (over 30%). The quantity of nonmetallic inclusions in

Card 2/3

steel was slightly lower than usual in steel smelted in the usual process under carbide slag with long refining. There are 7 figures, 5 tables and 7 Soviet references.

ASSOCIATION: Dnepropetrovskiy metallurgicheskiy institut (Dnepropetrovsk Metallurgical Institute); zavod "Dneprospetsstal'" ("Dneprospetsstal'" Works)

SUBMITTED: November 12, 1959

Card 3/3

18.3200

75953
SOV/133-59-10-14/39

AUTHORS: Vorob'yeva, T. M., Zabaluyev, I. P., Kalinnikov, Ye. S., Tregubenko, A. F.

TITLE: Effects of Vacuuming on the Quality of 30KhGSNA and ShKh15-Type Steels

PERIODICAL: Stal', 1959, Nr 10, pp 904-907 (USSR)

ABSTRACT: At "Dneprospetsstal'" Plant (zavod "Dneprospetsstal'") experimental vacuuming was conducted by Bobkov, T. M., Shamil', Yu. P., Parkhomenko, G. P., Shabli, N. M., and Men', A. N., according to the following methods: (1) 10 melts, at normal rimming with a minimum oxidation of 0.50% C and ladle pouring, placed in a vacuum chamber; (2) 10 melts, at maximum oxidation of 0.31% C during rimming, otherwise treated as above; and (3) 8 melts poured without vacuuming. The authors draw the following conclusions based on experimental data: (1) Vacuum treatment of molten metal at 4 to 5 t/min speed of entering vacuum chamber lowers hydrogen content. In 30KhGSNA-steel specimens molten within a limited rimming period

Card 1/2

Effects of Vacuuming on the Quality of 30KhGSNA and ShKh15-Type Steels

75953
SOV/133-59-10-14/39

and poured at 28 mm mercury column the hydrogen content dropped by an average 16%; in melting with normal rimming and pouring at 26 mm mercury column it dropped 18%. In steel-ShKh15 specimens poured at 20 mm mercury column a 24% decrease of hydrogen was observed. (2) The quality of 30KhGSNA steel, especially in respect to impact toughness, improved in pouring under vacuum at a residual pressure of 26 to 28 mm mercury column. (3) In pouring at residual pressure of about 20 mm mercury column the quality of ShKh15 steel shows no improvement in regard to nonmetallic inclusions. (4) Decreased oxidizing period in melting 30KhGSNA steel by a reduction of the quantity of oxidizing carbon from 0.50—0.70 to 0.20—0.30% does not increase gas saturation or impair quality, and even promotes impact characteristics. There are 4 tables; and 3 Soviet references.

Card 2/2

CHUYKO, M.M.; RUTKOVSKIY, V.B.; KONISHCHEV, M.P.; PEREVYAZKO, A.G.;
TREGUBENKO, A.F.; YATSKEVICH, I.S.; ZABALUYEV, I.P.; KURGANOV, V.V.;
BOBKOV, T.M.; ANTIPENKO, G.I.

New process of making ShKh-15 all-bearing steel under white slags.
Izv. vys. ucheb. zav.; chern. met. no.8:38-47 '60.
(MIRA 13:9)

1. Dnepropetrovskiy metallurgicheskiy institut i zavod "Dneprospetsstal'".
(Bearing metals) (Steel--Metallurgy)

S/148/61/000/002/003/011
A161/A133

AUTHORS: Kalinnikov, Ye. S., Zabaluyev, I. P.

TITLE: The problem of hydrogen content in alloyed electric steel

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, no. 2, 1961, 45 - 50

TEXT: The results of previous work [Ref. 1: Trudy NTO ChM(NTO ChM works), vol. XVIII, Metallurgizdat, 1957, 572 - 575; Ref. 2: T. M. Vorob'yeva, I. P. Zabaluyev, Ye. S. Kalinnikov, A. F. Tregubenko, "Stal'", 1959, no. 10, 904 - 907] are brought into a system in this article. The subject investigation consisted in melting several machinery and bearing steel grades in 25 - ton electric furnaces with basic lining and treating in a vacuum in two different ways. From a total of 100 melts one third was poured as usual at the plant, and the remainder was vacuum treated: 1) By placing the ladle with the liquid steel and the ordinary slag quantity into a vacuum chamber, closing the chamber and evacuating; holding in the vacuum for 12 min; 2) Pouring the steel from one ladle into the other in a vacuum chamber at a rate of 4 - 5 ton/min. In the second method aluminum was added not as usual in the furnace, but after degassing the metal. It was consider-

Card 1/3

S/148/61/000/002/003/011

The problem of hydrogen content in alloyed electric steel A161/A133

ed that a variation of the chemical composition of steel has practically no effect on the hydrogen solubility, therefore all melts may be considered as iron melts containing hydrogen that dissolves following the square root law. The hydrogen absorption by a steel bath under slag on the surface was calculated using the H. Epstein et al. formula [Ref. 5: H. Epstein, J. Chipman, N. Grant. J. Metals, 9, 1957]. It was stated that a direct relation really exists between the hydrogen content in the steel and the air humidity. The considerable scattering of these data is explained by different factors including the different humidity of ore and lime that absorbed humidity from ambient air. Only 9% hydrogen liberated in vacuum from one steel grade in ladle, and 24% from another grade repoured from ladle to ladle, but it was not possible to compare the effect in figures, for hydrogen liberation depends not on the pressure and degassing conditions only but on the equilibrium state of metal as well. A direct interdependence was revealed between the hydrogen quantity liberated in the vacuum from a ladle at a given temperature and time, and the initial hydrogen content and residual pressure in the vacuum chamber. It is expressed by the empirical formula

$$\Delta H_{real} = 0.44\,\Delta H_{theor} - 0.33 \qquad (4)$$

The analogous correlation stated at repouring in vacuum was

Card 2/3

S/148/61/000/002/003/011
The problem of hydrogen content in alloyed electric steel A161/A133

$$\Delta H_{real} = 0.99 \, \Delta H_{theor} - 0.57 \quad (5)$$

Both these formulas are not accurate but reflect well the relative effect of different vacuum treatment. Conclusions: 1) The effect of vacuum treatment with repouring on hydrogen liberation from well-deoxidized alloyed electric steel is more than double comparing with vacuum treatment in the ladle. The effect of vacuum treatment in the ladle can be improved by radically changing the deoxidization practice. 2) The hydrogen content in electric steel before tapping from the furnace depends directly on the humidity of ambient air. 3) The hydrogen content in electric steel practically does not change during pouring from the furnace into the ladle. There are 3 figures and 9 references: 5 Soviet-bloc and 4 non-Soviet-bloc. Two references to English-language publications read as follows: H. Epstein, J. Chipman, N. Grant, J. Metals, 9, 1957; E. T. Turkdogan, L. S. Davis, L. E. Lenke, L. G. Stevens. J. Iron Steel Inst., 1955, 181, 123 - 128).

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii (Central Scientific Research Institute of Ferrous Metallurgy)

SUBMITTED: December 16, 1959

Card 3/3

S/133/61/000/003/008/014
A054/A033

AUTHORS: Zabaluyev, I. P., Engineer, and Moshkevich, Ye. I., Engineer

TITLE: The causes of bulging of ingots and slabs

PERIODICAL: Stal', no. 3, 1961, 249 - 251

TEXT: Bulging, porosity, lamination and cavites are frequently found in several types of steel: 45Г17Ю3 (45G17Yu3), 80Г20Ю4 (80G20Yu4), ШХ 15 (Shkh15), etc. as well as in rimming and killed, carbon and alloyed steels, after both hot and cold settling. Slabs and billets made from the upper part of the casting show mostly these defects, while those cast from the lower part of the slab are free of them. No change is found in the chemical composition of steel displaying porosity or other defects, only aggregation of iron oxides, manganese and aluminum are to be observed in their macrostructure. As a rule, bulging and porosity only occur in the ingots, slabs, etc., when they are heated above the permissible temperature for this kind of steel and when the holding is longer than prescribed. In some steels the defects appear even at permissible temparatures, after extended holding times. V. M. Chirkin and F. A. Ksenzuk (Ref. 1: Stal',

Card 1/4

S/133/61/000/003/008/014
A054/A033

The causes of bulging of ingots and slabs

1960, No. 1) have put forward a theory according to which bulging is caused by gases precipitating from the metal itself. This theory, however, could not be substantiated. Neither hydrogen contained in rimming steel in amounts of 1 - 2 ml/100 g, nor nitrogen can be the cause of gas-formation and consequently, of bulging. Nor does this theory give an explanation why bulging is only found in the metal when superheated and held at this temperature for a long time, if other conditions (gas saturation, liquation) are identical. Bulging, porosity, black spots, etc. can better be explained by the following theory. A) When the ingots are put in the soaking pit with the inner part not yet solidified completely: 1. Furnace gases penetrate the liquid metal through shrinkage cavities and due to this, the oxygen, hydrogen and nitrogen content of the metal increases; 2. Superheating and over-extended holding times promote the adsorption of furnace gases in the metal, which fill up the cavities formed during crystallization of the metal; 3. When the ingots are discharged from the heating furnace or when the temperature of the latter drops, a skin is formed on the metal, the inner part of which solidifies and the pressure of gases separating in the hollow of the ingot results in bulging. B) The mechanism of bulging is somewhat different when the ingots are put into the soaking pit

Card 2/4

in cold condition or when their inner part has solidified completely: 1. When the ingots are superheated and the holding time extended at high temperatures the metal smelts in the axial parts of the ingot, containing various inclusions and having a relatively low smelting temperature; 2. Also in this case the furnace gases penetrate the metal through shrinkage cavities and fill up the hollows forming in the metal. When the ingot is heated up to the temperature prescribed for rolling or forging, these cavities fill up and the continuity of the macrostructure will be restored. When, however, the metal is overheated, the furnace gases captured in the metal oxidise the walls of the cavities and, after rolling, the macrostructure of the metal is porous. For the same reason, during deep pickling, the inner part of the template is pickled more intensely, resulting in the formation of black spots. As a rule, the higher the superheating and the longer the excessive holding time, the more porous the macrostructure of the ingot becomes during rolling. The formation of cavities is also promoted by the rapid heating of cold ingots, at the outset, when the metal is still in a plastic condition. In ingots, which have been charged in hot condition with a completely crystallized inner part, no bulging can be observed

S/133/61/000/003/008/014
A054/A033

The causes of bulging of ingots and slabs during rolling. There are 3 figures and 3 Soviet references.

ASSOCIATION: Zavod "Dneprospetsstal'" (The Dneprospetsstal' Plant)

Card 4/4

L 40903-66 EWP(k)/EWT(m)/T/EWP(w)/EWP(t)/ETI IJP(c) JH/JD

ACC NR: AP6018223 (N) SOURCE CODE: UR/0383/66/000/001/0025/0027

43
B

AUTHOR: Zabaluyev, Yu. I.; Nikitin, B. M.; Yakovlev, N. F.; Kaganovskiy, G. P.; Akulov, V. P.; Zabaluyev, I. P.

ORG: none

16

TITLE: Improving the quality of 30KhGSNASh electroslag remelted steel

SOURCE: Metallurgicheskaya i gornorudnaya promyshlennost', no. 1, 1966, 25-27

TOPIC TAGS: chromium steel, added mechanical property, steel microstructure

6
11

ABSTRACT: The authors investigate electroslag remelting to eliminate hairline cracks and structural discontinuities occuring in 30KhGSNASh steel after standard smelting produced lengthwise cracks and low values for area cross section reduction in ingots (using slag ANF-6) and in rolled billets (using slag AN-291). Experiments to determine the effects of heat treatment, cooling technology, and final deoxidant admixture indicate that the killing technique is primarily responsible for the occurrence of structural defects. Elimination of the latter and improved mechanical properties were attained by limiting the amount of Al added to the basic metal as final deoxidant. Orig. art. has: 2 tables and 1 figure.

21

SUB CODE: [illegible]

ZABALUYEV, I.P.; KAGANOVSKIY, G.P.; ZABALUYEV, Yu.I.

Improving the quality of calibrated ball-bearing steel made with electric slag refining. Stal' 25 no.7:653-654 Jl '65. (MIRA 18:7)

1. Zavod "Dneprospetsstal'".

ZABALUYEV, I.T., nauchnyy sotrudnik

Herbicides for cotton fields. Zashch. rast. ot vred. i bol. 8
no.5:18-19 My '63. (MIRA 16:9)

1. Chardzhouskaya sel'skokhozyaystvennaya opytnaya stantsiya.
(Turkmenistan--Cotton growing)
(Turkmenistan--Weed control)

ZABALUYEV, A.A.

MILONOV, Yuriy Konstantinovich; ZABALUYEV, M.A., spetsial'nyy red.; YURCHENKO, L.I., red.; BODANOVA, A.P., tekhn.red.

[Building materials in Magadan Province; notes of a research man]
Stroitel'nye materialy Magadanskoi oblasti; zametki ispytatelia.
[Magadan] agadanskoe knizhnoe izd-vo, 1957. 71 p. (MIRA 11:2)
(Magadan Province--Building materials)

ZABALUYEV, V.; ZORIN, V.

Guarantee of success lies in team work. Sov.profsoiuzy 7 no.4:19-22 Mr '59. (MIRA 12:4)

1. Predsedatel' Novosibirskogo sovnarkhoza (for Zabaluyev). 2. Predsedatel' Novosibirskogo oblsovprofa (for Zorin).
(Novosibirsk Province--Labor productivity)

SOV/180-59-2-32/34

AUTHORS: Zabavin, V.I., and Nemtsova, V.G. (Moscow)

TITLE: Thermal Hydrolytic and Hydrolytic Dissociation of the Basic Organic Material of Brown Coals (Termogidroliticheskoye i gidroliticheskoye rasshchepleniye osnovnoy organicheskoy massy burykh ugley)

PERIODICAL: Izvestiya akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1959, Nr 2, pp 168-173 (USSR)

ABSTRACT: The brown coals tested were from the Podmoskovnyy (clarain), Chelyabinskiy (clarain) and Bogoslovskoye (vitrain, clarain and durain) reserves. The petrographic types are given in Table 1 and the analysis in Table 2. The bitumen contents and humic acid contents were found and the residues subjected to hydrolytic dissociation - heating with 5% KOH in alcohol and pyridine, or thermal hydrolytic dissociation - heating to 280 °C in α-naphthol followed by treatment in KOH, alcohol and pyridine. The vitrain and clarain almost completely dissolved after a short thermal hydrolytic treatment, and durain after a hydrolytic treatment. Analysis for the elements present, the carboxyl and the phenolic hydroxyl groups was carried out. The molecular weight and equivalent weight were also found. Results

Card 1/2

SOV/180-59-2-32/34

Thermal Hydrolytic and Hydrolytic Dissociation of the Basic Organic Material of Brown Coals

are given in Table 3. Bitumin content was 1-5% in all, and humic acid content 4-19% in the first four samples and 73% in durain. Oxide content of the first four after thermal hydrolytic treatment was 62-79%, and that of durain after a hydrolytic treatment 8%. 30-49% of the oxygen is present as phenolic hydroxyl groups and 0.2-3% as carboxyl groups. The molecular weights of the products of brown coal of an oxide character were determined cryoscopically and were from 201-541. The equivalent weights from chemisorption data were 119-232.

Card 2/2 There are 3 tables and 12 references, 9 of which are Soviet, 2 English and 1 German.

SUBMITTED: April 8, 1958

ZABALUYEV, V. I.

23475. K PROBLEME MEKhANIZATsII LESOKhOZYaYSTVENNYKh RABOT. V SB: ISSLEDOVANIYa PO LES. KhOZ-VU. L., 1948 (NA OBL: 1949), c. 81-115

SO: LETOPIS' NO. 31, 1949.

ZABALUYEV, V.T.

The foreman is the educator of his team. Mashinostroitel' no.9:14-15 S '64. (MIRA 17:10)

1. Zamestitel' predsedatelya Zapadno-Sibirskogo soveta narodnogo khozyaystva.

ZABALUYEV, V.V.

Geology and history of the development of the Verkhoyansk marginal trough in a portion of the western Verkhoyansk Range. Trudy VNIGRI no. 130:158-182 '59. (MIRA 14:4)
(Verkhoyansk Range--Geology)

GOL'BRAYKH, I.G.; ZABALUYEV, V.V.; MIRKIN, G.R.

Tectonic analyses of mega jointing as prospective methods for studying closed areas. Sov. geol. 8 no.4:63-73 Ap '65. (MIRA 18:7)

1. Vsesoyuznyy neftyanoy nauchno-issledovatel'skiy geologorazvedochnyy institut.

GOL'BRAYKH, I.G.; ZABALUYEV, V.V.; MIRKIN, G.R.; SHAPOSHNIKOV, V.M.

Methods for studying the tectonics of closed areas. Geol.nefti i gaza 7 no.2:44-49 F '63. (MIRA 16:2)

1. Vsesoyuznyy neftyanoy nauchno-issledovatel'skiy geologorazvedochnyy institut i Stavropol'skiy filial Groznenskogo nauchno-issledovatel'skogo neftyanogo instituta.
(Geology, Structural)

SMOLYAKOV, V.F.; SHUL'TE, Yu.A.; MEDOVAR, B.I.; GAREVSKIKH, I.A.;
LATASH, Yu.V.; TSIVIRKO, E.I.; ZABALUYEV, Yu.I.; TOPCHIY, S.F.

Nonmetallic inclusions in electric slag refined 12Kh2N4A structural steel. Met. i gornorud. prom. no.4:35-37 Jl-Ag '64.
(MIRA 18:7)

EWT(m)/EWP(t)/ETI/EWP(k) IJP(c) JD

ACC NR: AP6031512 SOURCE CODE: UR/0383/66/000/004/0017/0019

AUTHOR: Zabaluyev, Yu. I.; Kaganovskiy, G. P.; Vul'fovich, M. S.

26

ORG: none

TITLE: Foreign inclusions in electroslag and vacuum arc melted steels

SOURCE: Metallurgicheskaya i gornorudnaya promyshlennost', no. 4, 1966, 17-19

TOPIC TAGS: electroslag ~~steel~~ melting, vacuum ~~[illegible]~~ melting, METAL PURIFICATION

ABSTRACT: The origin of foreign inclusions found sometimes in electroslag and vacuum-arc melted steel ingots has been investigated. It was found that most of the inclusions consist of fragments of consumable electrodes loosened by cracking of the latter. One of the reasons for electrode cracking is the accumulation of thermal stresses originated during cooling after rolling. Steels ShKh15, ShKh15SG R18(M) and some others are the most susceptible to cracking during the initial period of melting. Preventive measures to avoid the contamination of steel are suggested. Orig. art. has: 4 figures. [ND]

SUB CODE: 11, 13/ SUBM DATE: none/ ORIG REF: 006

Card 1/1

UDC: 669.083.4:669.18

L 17702-66 EWT(m)/EWA(d)/EWP(t) IJP(c) JD/HW/JG

ACC NR: AP6007172

SOURCE CODE: UR/0130/66/000/002/0018/0018

AUTHOR: Vul'fovich, M. S.; Zabaluyev, Yu. I.; Kaganovskiy, G. P.

ORG: Dneprospetsstal Plant (Zavod "Dneprospetsstal")

TITLE: Improving the surface quality of EI654 steel ingots

SOURCE: Metallurg, no. 2, 1966, 18

TOPIC TAGS: steel, chromium steel, nickel containing steel, titanium containing steel, aluminum containing steel, austenitic steel, steel melting, electroslag melting

ABSTRACT: Ingots of EI654 chromium-nickel-titanium-aluminum steel electroslag melted at the Dneprospetsstal' plant used to have a specific defect, surface corrugations, especially in the bottom part. These corrugations caused laminations during rolling. An investigation revealed that the corrugations occur primarily due to the insufficient heating of the slag bath, especially on the periphery, which in turn was due to the fact that the bottom plate was insulated from the mold and that refractory oxides were present in the ANF-6 slag. The slag was pretreated with titanium sponge and aluminum powder to reduce the iron- and silicon oxide. The insulation plate was removed to establish direct contact between the mold and the bottom plate. A fresh ANF-6 flux was used and argon consumption was increased by 50% to reduce the oxidation of aluminum and titanium. These precautions completely eliminated the surface corrugations and made it possible to reduce the unusable bottom part of the ingot from 25 to 9%. Orig. art. has: 2 figures. [ND]

Card 1/2

UDC: 669.141.247